

QUESTÃO 5

a) MOSTRE que $\ln(x - \sqrt{x^2 - 1}) = -\ln(x + \sqrt{x^2 - 1}) \quad \forall x \geq 1$.

$$\ln(x - \sqrt{x^2 - 1}) = \ln\left(\left[(x - \sqrt{x^2 - 1})^{-1}\right]^{-1}\right) = -\ln\left[(x - \sqrt{x^2 - 1})^{-1}\right] =$$

$$-\ln\left(\frac{1}{x - \sqrt{x^2 - 1}}\right) = -\ln\left(\frac{1}{x - \sqrt{x^2 - 1}} \cdot \frac{x + \sqrt{x^2 - 1}}{x + \sqrt{x^2 - 1}}\right) = -\ln\left(\frac{x + \sqrt{x^2 - 1}}{x^2 - (x^2 - 1)}\right) =$$

$$-\ln\left(\frac{x + \sqrt{x^2 - 1}}{1}\right) = -\ln(x + \sqrt{x^2 - 1}) \quad \blacksquare$$